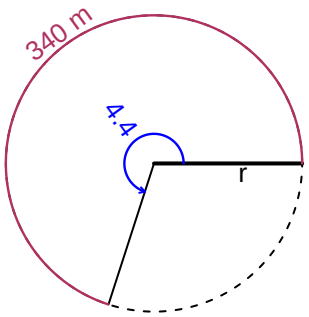
Name: Date:

Trig Final (Practice v20)

- You should have a calculator (like Desmos) and a unit-circle reference sheet.

Question 1

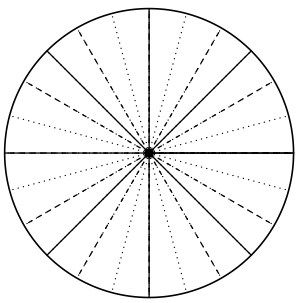
In the figure below, we see a circle and a central angle that subtends an arc. The arc length is 340 meters. The angle measure is 4.4 radians. How long is the radius in meters?



Question 2

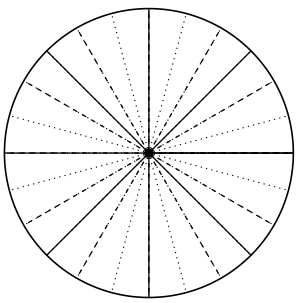
Consider angles $\frac{10\pi}{3}$ and $\frac{-9\pi}{4}$. For each angle, use a spiral with an arrow head to **mark** the angle on a circle below in standard position. Then, find **exact** expressions for $\sin\left(\frac{10\pi}{3}\right)$ and $\cos\left(\frac{-9\pi}{4}\right)$ by using a unit circle (provided separately).

Mark $\frac{10\pi}{3}$



Find $\sin(10\pi/3)$

Mark $\frac{-9\pi}{4}$



Find $\cos(-9\pi/4)$

Question 3

If $\tan(\theta) = \frac{-63}{16}$, and θ is in quadrant IV, determine an exact value for $\sin(\theta)$.

Question 4

A mass-spring system oscillates vertically with a midline at $y = 7.74$ meters, a frequency of 4.02 Hz, and an amplitude of 2.76 meters. At $t = 0$, the mass is at the midline and moving up. Write an equation to model the height (y in meters) as a function of time (t in seconds).